

Date:  
June 29, 2005

Report #  
K-422627

High Current Test Laboratory  
Kinectrics Inc., Canada  
Test Summary



**Client**

Westex Inc.  
2845 W. 48th Place  
Chicago, IL 60632

**Fabric description**

14 oz/yd<sup>2</sup> S/391 Denim

**Reference Standard**

ASTM F1959/F1959M-04 Standard Test Method for Determining the Arc Rating of Materials for Clothing

**Test Parameters:**

Test current: 8.02kA

Number of samples analysed: 21

Distance to Fabric: 12

Incident Energy Range: 17 to 22 cal/cm<sup>2</sup>

Arc Gap: 12

**Summary**

The arc rating of this material is intended for use as flame resistant clothing for workers exposed to electric arcs. The material used in this test method are in the form of flat specimens, actual performance of the complete garment may vary depending on the final design and assembly of the garment. This test method does not apply to the electrical contact or electrical shock hazard.

Based on the data obtained and analysed in accordance with the latest version of the applicable standards, the following Arc Rating was calculated.

**Arc Thermal Performance Value, ATPV = 19.5 Cal/cm<sup>2</sup>  
Heat Attenuation Factor, HAF = 88.0%**

Panel data and observations of the fabric samples after the arc exposure were collected and summarized in the attached table. The graphs and statistics on the attached sheets provide more detailed information to better understand the Arc Rating assigned to this material. The client shall review this full report, the video recordings of the arc exposure and the photographs of the samples after the test to determine if the material meets the intended specification.

**Test performed by:**

C. Maurice  
Kinectrics Inc.  
Toronto, Ont.

**Contact information**

Josh Moody  
Westex Inc.  
Tel: 773-523-7000

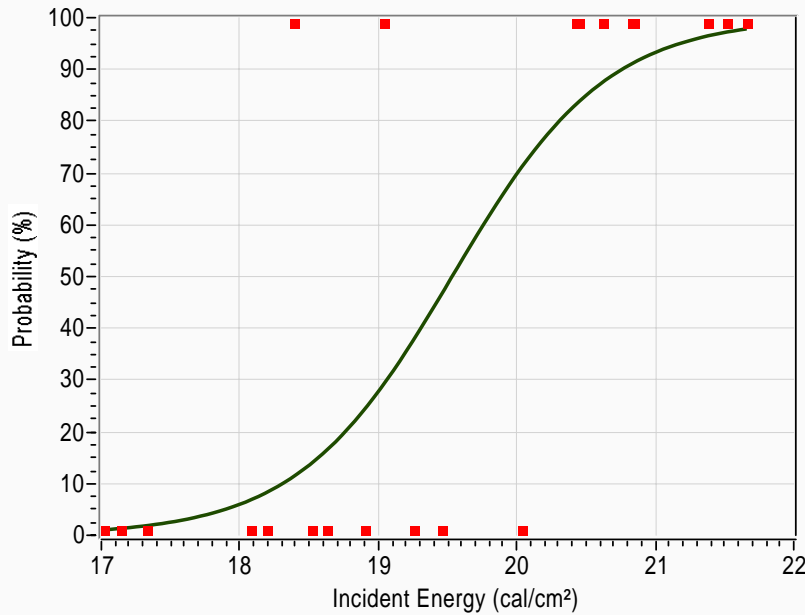
**ASTM F1959/F1959M-04**  
**Standard Test Method for Determining the Arc Rating of Materials for Clothing**



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Determination of ATPV, 50% Probability of 2nd Degree Burn

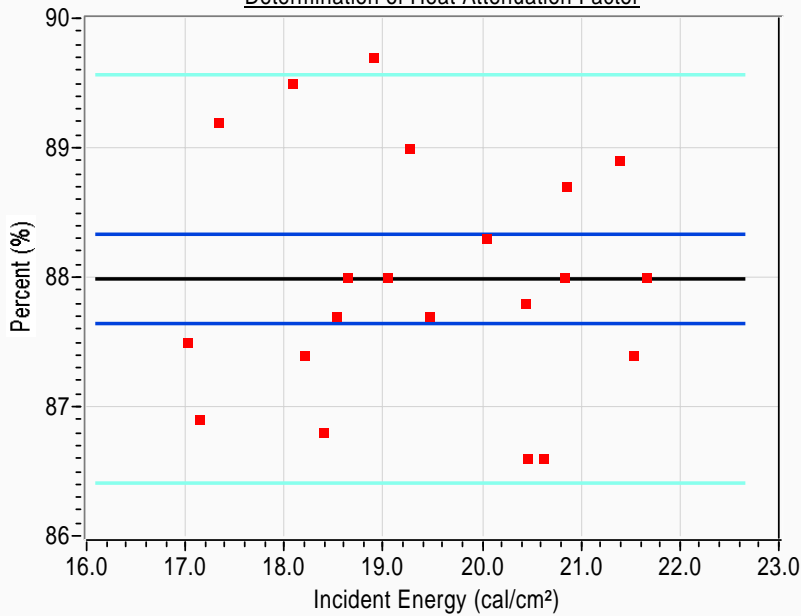


**ATPV = 19.5 cal/cm<sup>2</sup>**

| Probability of Burn | E <sub>i</sub> |
|---------------------|----------------|
| 5%                  | 17.9           |
| 10%                 | 18.3           |
| 20%                 | 18.8           |
| 30%                 | 19.1           |
| 40%                 | 19.3           |
| 50%                 | 19.5           |
| 60%                 | 19.8           |
| 70%                 | 20.0           |
| 80%                 | 20.3           |
| 90%                 | 20.8           |

- # Pts = 21
- # Pts above Stoll = 10
- # Pts Break-Open = 0
- # Pts always >STOLL = 8
- # Pts always <STOLL = 5
- # Pts within 20% = 21
- # Pts in mix zone = 8

Determination of Heat Attenuation Factor



**HAF = 88.0 %**

Confidence Intervals  
 95% CI = 87.6 , 88.3

- Data pts
- Best Fit
- 95% CI
- 95% CI pts

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| Test # | Panel   | Cycles # (60Hz) | Ei cal/cm <sup>2</sup> | SCD cal/cm <sup>2</sup> | HAF % | Burn yes/no | Break Open Y/N | After Flame sec. | Omit Y/N | Comment | Ignition T-shirt |
|--------|---------|-----------------|------------------------|-------------------------|-------|-------------|----------------|------------------|----------|---------|------------------|
| 1      | 05-2250 | A               | 22.2                   | 18.08                   | -0.30 | 89.5        | No             | -                | -        | No      |                  |
| 2      | 05-2250 | B               | 22.2                   | 18.39                   | 0.23  | 86.8        | Yes            | -                | -        | No      |                  |
| 3      | 05-2250 | C               | 22.2                   | 17.33                   | -0.24 | 89.2        | No             | -                | -        | No      |                  |
| 4      | 05-2251 | A               | 24.2                   | 20.85                   | 0.07  | 88.7        | Yes            | -                | -        | No      |                  |
| 5      | 05-2251 | B               | 24.2                   | 20.83                   | 0.11  | 88.0        | Yes            | -                | -        | No      |                  |
| 6      | 05-2251 | C               | 24.2                   | 19.46                   | -0.06 | 87.7        | No             | -                | -        | No      |                  |
| 7      | 05-2252 | A               | 21.3                   | 18.90                   | -0.32 | 89.7        | No             | -                | -        | No      |                  |
| 8      | 05-2252 | B               | 21.3                   | 18.20                   | -0.08 | 87.4        | No             | -                | -        | No      |                  |
| 9      | 05-2252 | C               | 21.3                   | 17.14                   | -0.20 | 86.9        | No             | -                | -        | No      |                  |
| 10     | 05-2253 | A               | 25.1                   | 21.38                   | 0.01  | 88.9        | Yes            | -                | -        | No      |                  |
| 11     | 05-2253 | B               | 25.1                   | 20.45                   | 0.35  | 86.6        | Yes            | -                | -        | No      |                  |
| 12     | 05-2253 | C               | 25.1                   | 20.62                   | 0.32  | 86.6        | Yes            | -                | -        | No      |                  |
| 13     | 05-2254 | A               | 24.2                   | 20.04                   | -0.05 | 88.3        | No             | -                | -        | No      |                  |
| 14     | 05-2254 | B               | 24.2                   | 21.66                   | 0.27  | 88.0        | Yes            | -                | -        | No      |                  |
| 15     | 05-2254 | C               | 24.2                   | 18.63                   | -0.14 | 88.0        | No             | -                | -        | No      |                  |
| 16     | 05-2255 | A               | 24.2                   | 20.43                   | 0.29  | 87.8        | Yes            | -                | -        | No      |                  |
| 17     | 05-2255 | B               | 24.2                   | 21.52                   | 0.31  | 87.4        | Yes            | -                | -        | No      |                  |
| 18     | 05-2255 | C               | 24.2                   | 18.52                   | -0.09 | 87.7        | No             | -                | -        | No      |                  |
| 19     | 05-2256 | A               | 22.2                   | 19.26                   | -0.09 | 89.0        | No             | -                | -        | No      |                  |
| 20     | 05-2256 | B               | 22.2                   | 19.04                   | 0.00  | 88.0        | Yes            | -                | -        | No      |                  |
| 21     | 05-2256 | C               | 22.2                   | 17.02                   | -0.25 | 87.5        | No             | -                | -        | No      |                  |
| 22     |         |                 |                        |                         |       |             |                |                  |          |         |                  |
| 23     |         |                 |                        |                         |       |             |                |                  |          |         |                  |
| 24     |         |                 |                        |                         |       |             |                |                  |          |         |                  |
| 25     |         |                 |                        |                         |       |             |                |                  |          |         |                  |
| 26     |         |                 |                        |                         |       |             |                |                  |          |         |                  |
| 27     |         |                 |                        |                         |       |             |                |                  |          |         |                  |
| 28     |         |                 |                        |                         |       |             |                |                  |          |         |                  |
| 29     |         |                 |                        |                         |       |             |                |                  |          |         |                  |
| 30     |         |                 |                        |                         |       |             |                |                  |          |         |                  |
| 31     |         |                 |                        |                         |       |             |                |                  |          |         |                  |
| 32     |         |                 |                        |                         |       |             |                |                  |          |         |                  |
| 33     |         |                 |                        |                         |       |             |                |                  |          |         |                  |
| 34     |         |                 |                        |                         |       |             |                |                  |          |         |                  |
| 35     |         |                 |                        |                         |       |             |                |                  |          |         |                  |

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